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A Comparison of Custom Rates Charged Landlords, Other Farmers, and Effective Ownership Use Costs

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A Comparison of Custom Rates Charged Landlords, Other Farmers, and Effective Ownership Use Costs

E. T. SHAUDYS and RICHARD D. DUVICK[1]

INTRODUCTION

Ohio farmers make extensive use of services provided by custom operators. Custom services for harvesting, plowing, fitting, planting, grain drying, and hauling of grain and livestock are examples of services hired. Flexibility, timeliness, procurement of skilled operators, experienced labor, and lower user costs are some of the reasons farmers employ the services of custom operators. Suppliers of custom services view it as a source of income. In addition, custom work may allow the farm operator to own newer, larger, and more efficient equipment.

Half of all farmers in Ohio reported hiring some custom services in the 1978 census.[2] Several farmers reported spending more than $5,000 for the work hired, with a few farmers spending $10,000 for custom work during the year. One Ohio farmer out of eight reported doing custom work for hire. Farmers performing custom work received an average income of $1,705 in 1978.

Farm operators have a long history of sharing equipment and labor skills for the performance of farm work. Custom threshing and silo filling services evolved when labor requirements and equipment investments exceeded that available on a farm unit. Farmers "pooled" labor and capital in order to enjoy a more efficient and lower cost equipment use capability. Exchange of equipment, partnerships, borrowing, rental and leasing of equipment, and custom hire are evidence of the willingness of farmers to use non-ownership methods of gaining the use of the needed equipment services.

The custom service market has several unique characteristics. For most farm work, availability at the optimum time is extremely important. The equipment and labor resource contribution to crop and livestock income and profitability is greatly influenced by the timely performance of critical jobs. A delay of even 1 day for baling hay or harvesting grain can have a significant impact on the quality and quantity of the crop harvested and consequently on the income earned.

The skill in operating, adjusting and maintaining equipment, and adapting to current operating conditions are important profit vectors. The custom service market must accommodate these variables while adjusting rates in a competitive but rapidly changing imperfect market.

It is recognized that the custom operator may be doing the work for a relative, friend, neighbor, landlord, or another farmer. In certain situations, the custom operator-employer roles will change from job to job. For example, a farmer may combine soybeans for a neighbor and, in turn, this neighbor may bale the combine operator's hay, each charging the other a custom fee.

The consolidation of several farm ownership units into larger operating units has resulted in the development of many multi-owner single tenant lease relationships. One result is that a farm operator may have a share interest in the crop produced, yet serve as the custom operator and charge a custom rate for harvesting the landlord's share of the crop. The farm lease may thus be influenced by the custom rate charged. These related concerns need to be examined.

OBJECTIVES

The production agriculture industry has a dynamic, changing structure. The following objectives were defined in order to examine some of the related issues to farm custom rate charges.

- To ascertain and compare custom rates charged other farmers and landlords for comparable services.
- To compare combine ownership costs and custom rates.
- To develop a profile of work performed by custom operators.

METHOD OF STUDY

A mailed questionnaire was sent to 1,680 farmers hiring and/or performing custom work during the 1980 season. Eighty-four county agents were provided packets of 20 questionnaires for distribution to farmers known to be involved with custom work in their counties. A response rate of 30% was achieved as 502 usable questionnaires were returned without follow-up.

Custom rates were summarized for the state and by four geographic regions of Ohio.[3] Within each

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[2]Census of Agriculture, U. S. Department of Commerce, Washington, D. C.

[3]Shaudys, E. T. and Richard D. Duvick. 1980. Farm Custom Rates Paid in Ohio, 1980. L-74, Ohio Coop. Ext. Serv., The Ohio State University, Columbus.

TABLE 1.—Custom Rates (per Acre) Charged Farmers and Landlords for Combining, by Area of Ohio, 1980.

Operation	Other Farmers		Landlords		Average	
	No.	Rate	No.	Rate	No.	Rate
Small Grain						
Northwest	96	$13.74	61	$11.62	157	$12.91
Southwest	104	15.26	50	13.82	154	14.79
Northeast	79	15.92	4	15.25	83	15.89
Southeast	86	15.26	9	14.67	95	15.20
Average	365	$15.00	124	$12.84	489	$14.45
Soybeans						
Northwest	74	$15.45	54	$13.01	128	$14.42
Southwest	98	18.67	47	16.48	145	17.96
Northeast	42	18.07	7	15.00	49	17.63
Southeast	31	18.65	9	16.61	40	18.19
Average	245	$17.60	117	$14.80	362	$16.69
Corn						
Northwest	68	$16.32	50	$13.33	118	$15.05
Southwest	93	19.25	45	17.08	138	18.54
Northeast	64	19.12	6	15.00	70	18.77
Southeast	67	18.55	10	17.60	77	18.42
Average	292	$18.38	111	$15.33	403	$17.54

region, similarities exist in cropping patterns, job size, topography, soil conditions, and travel distances involved in providing custom services. These regional groupings have been used to report Ohio custom rate information for the past 30 years. It is important to note that rate variations exist within a community because of differences in the operating conditions, timeliness, and competition for services performed.

CUSTOM RATES FOR FARMERS AND LANDLORDS

The leasing of farm land involves many considerations in addition to the share or monetary value of the rent. Concerns for the husbandry of the property, maintenance and improvement of fertility, weed control, amenities provided, and general farm "housekeeping" are reflected in many farm lease agreements. Landlords, in addition to income, are concerned with the care and improvement of their farms. Compensatory contributions effectively modify a lease. One such compensation made by a tenant operator may be reflected in the custom rate charged a landlord for work performed by the tenant as a part of that lease agreement.

TABLE 2.—Landlords as Percent of all Custom Employers by Area of Ohio, 1980.

Area	Small Grain	Soybeans	Corn
	percent		
Northwest	38.8	42.2	42.4
Southwest	32.5	32.4	32.6
Northeast	4.8	14.3	8.6
Southeast	9.5	22.5	13.0
Ohio	25.4	32.3	27.5

Deviations from the custom rates charged "other farmers" beneficially or adversely influence the lease agreement. A discount in the custom rate effectively increases the land rental benefits; conversely, a surcharge reduces rental income. Additionally, there is a psychological impact when a share tenant provides a discounted custom charge to a landlord. The fact that the market supports a higher rate than that used along with other considerations may cause a landlord to favor one tenant over another or over potential tenant operators.

Custom Rates for Combining

Combining corn, soybeans, and small grains is a common custom operation in Ohio. During the 1980 season, northwest Ohio combining custom rates were found to be the lowest of any region (Table 1). In this northwest region, the amount of custom work done by tenants for their landlords also represents a larger influence than that found in other regions. Approximately two of every five custom combining jobs reported were done by tenants for their landlord for a custom fee (Table 2). In this area, the rates charged landlords were found to be 15 to 18% less than for comparable work done for other farmers (Table 3). On a per acre basis, this difference averaged $2.12 per acre less for small grain, $2.44 per acre less for soybeans, and $2.99 per acre less for corn than the rates charged other farmers.

A similar pattern was found to exist for the southwest region of Ohio. Almost one-third of the custom combining jobs were tenant farmers performing work and charging a custom rate to their landlords. In the southwest region, the landlord discounts, compared to the rates charged other farmers, averaged $1.44 less per acre for small grain, $2.19 less per acre for soybeans, and $2.17 less per acre for corn. These discounts averaged 10 to 12% compared with rates charged other farmers.

Custom combining performed for landlords by tenant operators in the eastern part of the state were reported less frequently than for the northwest region. Soybeans combined by tenants for landlords were 14.3% of all custom combining service reported by landlords in northeast Ohio and 22.5% in southeast Ohio. This was followed in importance by corn with 8.6 and 13.0%, respectively, and small grain 4.8 and 9.5%, respectively, for the northeast and southeast regions. The discount of landlord custom charges compared to other farmers was also found to be smallest in the southeast region.

It is clear that combining grain for landlords is a significant part of the total custom activity of tenants, ranging from one-fourth to one-third of the custom work done (Table 2). Landlord discounts on a statewide average ranged from 14.4 to 16.6% of the rate charged other farmers for comparable service.

Other Custom Operations

Plowing, fertilizer application, planting, insect control, corn picking, baling, grain drying, and grain hauling were characterized as having smaller landlord discounts than was found for the combining activities. With a very few exceptions, the landlords are characterized as being charged lower rates for the same job than when work was performed for other farmers. However, the amount of the rate discount was much less for most non-combine operations than for the combine custom operations.

TABLE 3.—Landlord Custom Combining Discounts (Percent Below Typical Custom Rate) Compared to Farmers by Area of Ohio, 1980.

Area	Crop		
	Small Grain	Soybeans	Corn
Northwest	15.4	15.8	18.3
Southwest	9.4	11.7	11.3
Northeast	4.2	17.0	21.5
Southeast	3.9	9.9	5.1
Ohio	14.4	15.9	16.6

Operations such as fertilizer application, drilling small grain or soybeans, planting corn or soybeans, and grain drying reflect discounts ranging from 11 to 24% (Table 4). Plowing, picking corn, baling hay or straw, and hauling grain reflected discounts from 0 to 5%. One of every six jobs was reported as a tenant performing a custom service for his landlord. An exception was grain drying, where two of every five custom jobs reported were for tenants performing the work for landlords.

Area Rate Differentials

Typically, the lowest custom rates are found in the northwest region of Ohio (Table 5). For several operations the rates were 10 to 20% less than that found in other regions. The southwest and northeast regions tend to report the highest rates in the state for many custom jobs. Field size, topography, and landlord tenant custom hire may be responsible in part for the rate differential found.

COST OF COMBINE OWNERSHIP vs. CUSTOM HIRE

One typical farm operator concern is the cost vs. benefits when selecting from among the several machine use procurement alternatives. Choices including the purchase of new or used equipment, the size of machine to use, how often to trade, the value of

TABLE 4.—Custom Rates for Farmers and Landlords, Selected Operations, Ohio, 1980.

Operation	Unit	Other Farmers		Landlords		Average	
		No.	Rate	No.	Rate	No.	Rate
Plow	acre	248	$ 9.88	34	$ 9.47	282	$ 9.83
Appy fertilizer	acre	131	3.53	13	2.69	144	3.45
Grain drill	acre	111	5.96	19	5.19	130	5.85
Corn plant	acre	122	6.75	11	5.74	133	6.67
Spray application	acre	188	3.14	16	3.23	134	3.15
Pick corn	acre	64	15.06	13	14.30	77	14.93
Bale	bale	66	0.27	14	0.26	80	0.27
Dry grain 25-14%*	bu	68	0.18	46	0.16	114	0.17
Haul grain	bu	144	0.10	30	0.10	174	0.10

*Dry from 25% to 14% moisture.

TABLE 5.—Custom Rates by Area of Ohio for Selected Operations, 1980.

Operation	Unit	Area							
		Northwest		Southwest		Northeast		Southeast	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate
Plow	acre	70	$ 8.69	115	$10.36	54	$10.55	43	$ 9.36
Apply fertilizer	acre	45	2.80	56	3.02	19	6.12	24	3.54
Grain drill	acre	34	5.57	45	5.50	34	5.21	17	8.63
Corn plant	acre	26	5.70	56	6.52	22	7.14	29	7.52
Spray application	acre	40	2.71	49	3.16	18	3.25	27	3.70
Pick corn	acre	20	12.80	12	16.65	18	16.16	27	14.92
Bale	bale	12	0.28	34	0.26	14	0.28	20	0.29
Dry grain 25-14 %*	bu	39	0.15	42	0.18	15	0.22	18	0.16
Haul grain	bu	32	0.08	68	0.10	28	0.10	46	0.12

*Dry from 25 % to 14 % moisture.

associated crop losses, and reliability of custom operators, etc. complicate the decision. In this section, some of the ownership costs as they may be experienced by a farmer are discussed and are compared with custom rates. While this approach differs from traditional accounting approaches, it may reflect how some farmers have viewed their ownership use cost, especially during this inflationary period.

Machine Ownership Costs

Direct costs of machine ownership may be categorized into investment cost and operating costs. Most farm machines provide satisfactory service for more than one production term. Thus, a prorated share of the investment must be charged for use in each term of production.

In order to represent the effective part of an annual investment cost for a combine, the following example situation was used. Starting in 1972, a combine was purchased without a trade and the dealer was paid the full list price. Straight line depreciation was determined by deducting an estimated salvage value from the purchase price and dividing the remaining depreciable value by number of years of expected use. It was assumed that "this farmer" would keep the combine 3 years and consume approximately half of the combine's anticipated useful life prior to trading. A replacement trade program would be continued every 3 years until the present. However, because of equipment price appreciation resulting from inflation, the trade value received for the combine was greater than residual or depreciated book value. That is, the anticipated salvage was less than the dealer trade allowance when replaced with a combine of the same capacity (Table 6).

For example, consider a large combine acquired for the cost of $42,500 in 1972 with an anticipated salvage value after 3 years of $17,000 and an effective annual depreciation of $8,500. The dealer allowed 50% ($33,710) of the new combine purchase price ($67,420) as the trade-in allowance for the acquired combine. This required that the farmer-buy-

TABLE 6.—Actual Investment Ownership Cost for a Small and a Large Combine, Ohio, 1980.*

Year	Cost†	Trade Allowance	Money Invested	Salvage 40 % New	Farmer Perceived Depreciation
			Small Combine‡		
1972-74	$24,170	cash	$24,170	$ 9,668	$ 4,834
1975-77	38,340	$19,170	19,170	15,336	6,390
1978-80	50,600	25,300	25,300	20,240	8,433
			Large Combine**		
1972-74	$42,500	cash	$42,500	$17,000	$ 8,500
1975-77	67,420	$33,710	33,710	26,968	11,237
1978-80	89,820	44,910	44,910	35,928	14,970

*Combines purchased new without trade in 1972 and traded for new combine after 3 years of use.
†Purchase cost reflects index of self-propelled farm equipment (combine + grain table + corn head) (Appendix Table 1).
‡13' grain table and 3 or 4 row corn head.
**20'-22' grain table and 8 row corn head.
Source: (1).

TABLE 7.—Annual Fixed Cost of Owning a Small and a Large Combine, Ohio, 1972-1980.

Years	Invested Mid-value*	Interest Rate†	Interest Cost	Insurance‡	Depreciation	Total
			Small Combine			
1972-74	$16,919	0.082	$1,387	$ 54	$ 4,834	$ 6,275
1975-77	17,235	0.083	1,431	86	6,390	7,907
1978-80	22,778	0.108	2,460	113	4,433	11,006
			Large Combine			
1972-74	$29,750	0.082	$2,440	$ 95	$ 8,500	$11,305
1975-77	30,339	0.083	2,518	151	11,237	13,906
1978-80	40,419	0.108	4,365	201	14,970	19,536

*Actual money invested plus carry forward original salvage. See Table 6.
†Average PCA rate, Appendix Table I.
‡Insured at cash mid-value for insurable full coverage (80% of cash mid-value x rate of $4.00 per $1,000 of value annually).

er must pay $33,710 of new money in order to acquire the replacement combine in 1975. This additional money is the farmer-buyer's cash expenditure and is perceived by the farmer-buyer as the effective depreciable investment cost.

This procedure was calculated for each year through 1980. A 3-year life (approximately half of the total use life) was used and the new money invested was prorated for each year for the 3-year period, resulting in the effective depreciation for both a large and a small size combine (Table 6).

The purchase cost indicates a much higher value than the actual amount of money invested by the farmer. For costing purposes, it is only the new investment money that represents the actual cash cost of owning the combine.

Many farmers have benefited from much higher trade allowances than used in this illustration. Realized trade values for a 3-year-old machine have often been considerably greater than the established salvage value. If this was experienced, the annual use cost that must be absorbed by the owner is effectively less than that illustrated.

In addition to depreciation, interest and insurance must be recognized as ownership investment costs. For these items the cash investment mid-value was used to represent the cost of a farmer's investment in the combine throughout the period 1972-1980 (Table 7). Interest rates applied to this mid-value represent PCA short-term loan rates. It is also recognized that many farmers may have had higher or lower investment cost. Some farmers may use a cash purchase rather than a finance purchase which could be reflected in a lower interest rate charge.

For analysis, the PCA rates used were selected as those in effect during the particular period of ownership considered (Appendix Table I). Insurance was costed in accord with typical mutual insurance rates at $4 per $1,000 of insurable value.[4] Adding the effective depreciation, interest, and insurance yields the annual direct investment cost for these combines for the 1972-1980 period.

Operating Costs

The operational costs of a combine were categorized as fuel, labor, and repairs. Rates of fuel consumption were derived from engineering studies. For a large combine, one capable of handling a 20 to 22-foot grain head and an 8-row corn head, a consumption of 7½ gallons of diesel fuel per hour was applied; for the small combine capable of handling a 13-foot grain table and a 3 or 4-row grain head, 6 gallons per hour of diesel fuel were used (Appendix Table II).[5] Performance rates of accomplishment for the combines were developed using a composite of the crops harvested (Appendix Table III).

In Ohio, almost 9 million acres of corn, soybeans, and small grains are available for harvest each year with a combine. Of this, the small grains accounted for 17.2%, soybeans 42.2%, and corn 40.6% of the total acreage harvested during recent years.[6] These percentages were multiplied times the rates of harvest for each of the crops in order to derive a composite rate per hour.

Four annual hourly use levels were considered ranging from 250 hours per year to 400 hours per year. Based on the annual hours of use, the acreage harvested, fuel, labor, and repairs, the operating costs for the two size combines were derived. Repairs were estimated at 25% of the new list purchase price for

[4]Shaudys, E. T. May 1980. Current and Average Prices for Use in Farm Planning, Ohio, 1980. ESO 723, Dept. of Agri. Econ. and Rural Sociol., The Ohio State University, Columbus.
[5]Lines, Allan E. May 1980. Farm Machines and Equipment 1980 Cost Estimates. ESO 663, Dept. of Agri. Econ. and Rural Sociol., The Ohio State University, Columbus.
[6]Ohio Agricultural Statistics. 1979. Ohio Crop Reporting Service, ESCS, U. S. Dept. of Agriculture, Columbus.

the first 1,000 hours of use. These hourly costs were expanded into the annual operating costs. Adding investment costs to operating costs yielded the total cost per year by periods for these two combines (Appendix Tables IV and V). The cost has been expressed on a per acre basis for comparison purposes (Table 8).

Comparative custom rates per acre for a composite of crops harvested are derived similarly in Appendix Table VI.

Ownership Costs and Custom Rates

Using these cost determinations, ownership costs can be compared with custom hire (Table 8 and Figure 1). As might be expected, when higher volumes of work or use were achieved, ownership costs were lower than the custom rates charged during each of the periods.

Large combines, when used to a comparable annual hourly capacity, were found to yield lower per acre costs than small combines. The differential of

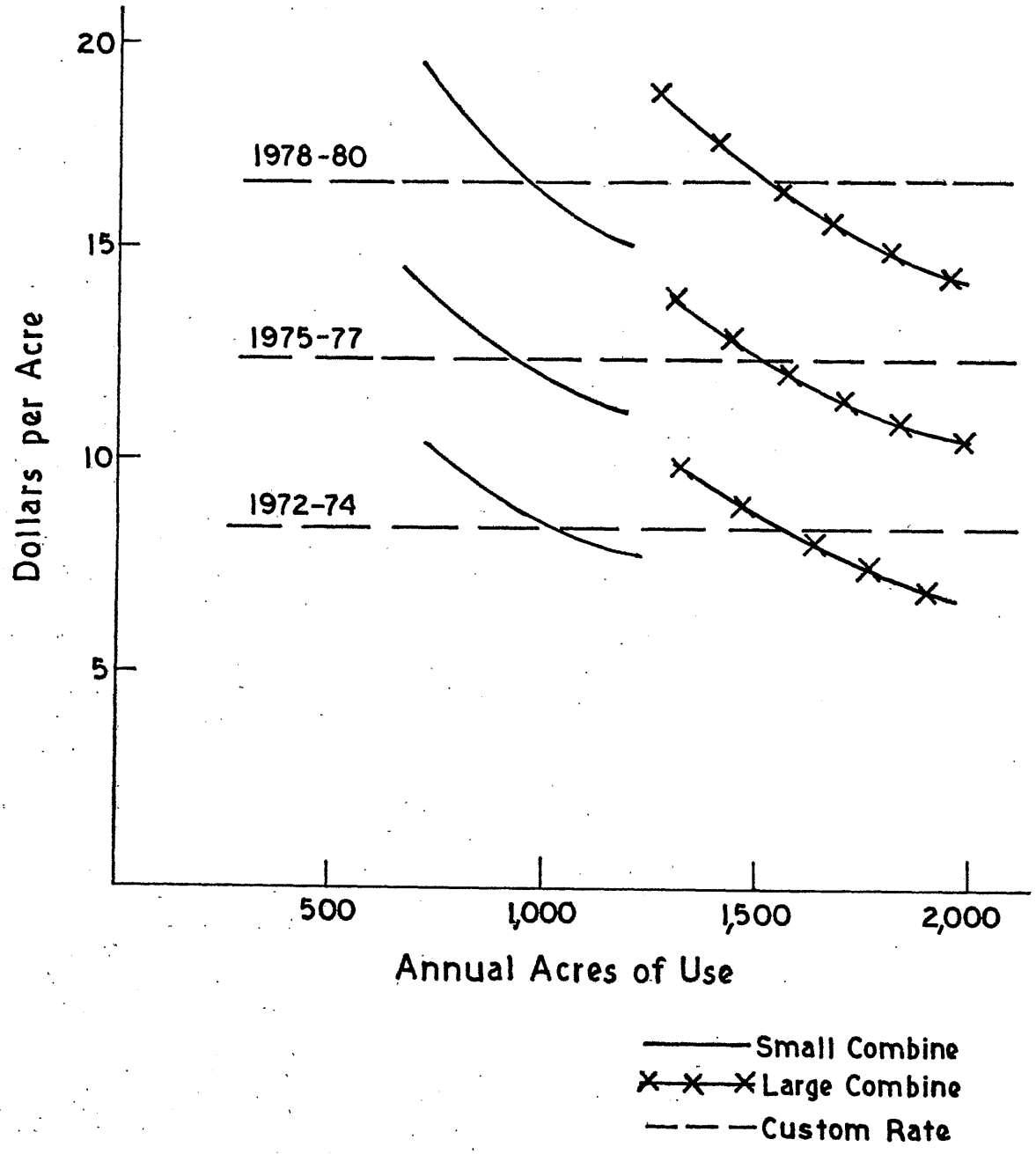

FIG. 1.—Combine ownership use costs and custom rates by two sizes of combine, Ohio, selected years.

TABLE 8.—Annual Custom Rate and Ownership Cost per Acre for a Small and a Large Combine by Hours of Use, Ohio, 1972-1980.

Period	Custom Rate*	Annual Hours of Use 250	300	350	400
Small Combine (acres/year)		740	888	1,036	1,184
1972-74	8.32	10.58	9.49	8.71	8.13
1975-77	12.02	14.64	13.20	12.17	11.40
1978-80	16.32	19.57	17.67	16.31	15.29
Large Combine (acres/year)		1,250	1,500	1,750	2,000
1972-74	8.32	10.19	9.08	8.28	7.67
1975-77	12.02	14.16	12.66	11.58	10.78
1978-80	16.32	19.03	17.03	15.67	14.54

*Appendix Table VI.

the large compared with the small combine for 400 hours of annual use was 75 cents per acre for the 1978-1980 period. For the smallest annual usage, 250 hours, the large combine cost was 54 cents per acre less than the small combine for the same period. It is significant to note, assuming comparable performance, that the large combine must be used about 320 hours per year, or for 1,600 acres, to achieve a lower per acre cost than the custom hire rate. The small combine required more than 350 hours and about 1,100 acres to reach the custom rate break-even cost.

It is recognized that many farmers owning machines may have effective costs lower than those that have been derived above. Four elements of costs are recognized as having substantial impact as vectors responsible for the modification of these cost relationships. These include: 1) the increased capital for equipment ownership, 2) the increase in the cost of fuel, 3) the increased cost of labor, and 4) increased interest rate. During the 1972-1980 period, tractors and self-propelled machinery costs increased 2.6 times, fuel more than tripled, labor doubled in price, and interest rates increased by 78%.

Large combines permit more efficient fuel conversion and labor utilization than small combines. These cost differentials illustrate why farmer-buyers have correctly perceived that large combines, if used to capacity, yield a lower per acre cost than could be achieved with smaller units.

Several other elements are important and need to be considered when making a purchase vs. hire decision. While not generated empirically as part of this analysis, these are important considerations. For this purpose, the half-life of a combine was used. This assumes that other farmers will be buying the used combine and consuming the remainder of its life. The cost of this fraction of its utilization may be different than for the first half-life. Some of these component costs result from different timing of events and are of different magnitudes. One critical concern in any farm operation, of course, is timeliness. Down time resulting from any cause can be extremely costly compared to completing the work at the desired time.

Another important factor in machinery cost and replacement patterns is the impact of taxes. These same basic data and assumptions were used to estimate total combining costs using capital budgeting. In this the effect of the time at which expenses are incurred is discounted to get present values for each situation.

For these situations a 12% discount rate was used throughout. This is defined as the opportunity cost of capital, and is greater than the actual interest rate charged on borrowed funds for most of this period.

Two tax brackets are assumed — zero and 25 percent. A 7-year life is assumed so that full investment credit can be taken when the combine is purchased, and two-thirds must then be recaptured when it is traded in 3 years later. However, the full investment credit can then be taken on the replacement combine. Of course, with the zero tax bracket, the investment credit and other expenses are of no benefit to lower combine costs. With the 25% tax bracket, costs are reduced by the investment credit, plus 25% of the depreciation (7-year straight line) and operating cost. In addition, the 9% discount rate is used (*i.e.*, 12% less 25% of 12 or 3% less). This discount rate automatically accounts for both the interest charges and the down payment.

The annual costs for the zero tax rate are similar to those calculated by the previous approach (Table 9). However, when the 25% tax rate is assumed, combine costs per acre are significantly lower. Farm incomes (and potential tax liabilities) were quite high in several years during the 1972-1980 period and this illustrates how tax management can effectively lower costs for persons in higher tax brackets.

TABLE 9.—Annual Cost per Acre for a Small and a Large Combine by Hours of Use and Tax Bracket, Capital Budgeting Method, Ohio, 1972-1980.

Size, Tax Rate, and Period	Custom Rate*	Annual Hours of Use 250	300	350	400
Acres Combined/Year		740	888	1,036	1,184
Small Combine					
Zero % Tax Rate					
1972-74	8.38	$ 8.90	$ 8.02	$ 7.39	$ 6.92
1975-77	12.02	15.58	13.88	12.66	11.75
1978-80	16.23	20.92	18.65	17.03	15.80
25 % Tax Rate					
1972-74	8.38	$ 6.80	$ 5.41	$ 4.50	$ 4.29
1975-77	12.02	12.92	10.92	8.73	8.16
1978-80	16.23	17.64	14.27	12.12	11.17
Acres Combined/Year		1,250	1,500	1,750	2,000
Large Combine					
Zero % Tax Rate					
1972-74	8.38	$ 8.55	$ 7.64	$ 6.98	$ 6.49
1975-77	12.02	15.16	13.39	12.14	11.20
1978-80	16.23	21.21	18.10	16.41	15.15
25 % Tax Rate					
1972-74	8.38	$ 5.63	$ 5.08	$ 4.24	$ 3.62
1975-77	12.02	11.31	10.01	8.47	7.21
1978-80	16.23	15.60	13.81	11.60	9.95

Note: A 12 % opportunity cost for capital was used for the analysis. With the 25 % marginal tax rate, the opportunity cost of capital became 9 % [12 —0.25 (12)].
*Appendix Table VI.

WORK PERFORMED BY CUSTOM OPERATORS

For many jobs, the largest acreage of work performed by an average custom operator was found in the southwest region of Ohio. Second in importance was the northwest region (Table 10). It is significant to note that the range in work performance by custom operators for any job was large. For example, plowing performed by custom operators ranged from 1 to 950 acres, combining from 4 to 2,650 acres, and fertilizer application from 9 to 30,000 acres. Some of these small acreage performances were one neighbor accommodating another, while the very large may indicate a full-time custom service commitment.

It is also significant that average performance by a custom operator for many activities was modest. The analysis of combining corn, soybeans, and small grains revealed an average performance of 191 acres in the southwest region followed by 171 in the northwest, 141 northeast, and 110 in the southeast. Although the range was very wide, the concentration about the mean of 164 acres would indicate that many custom operators do relatively small acreages.

Spraying and fertilizer application tended to have relatively large acreages performed by an average custom operator. Whereas combining had an average of 164 acres, plowing 90, and planting 150, spraying was more than 800 acres and fertilizer application more than 1,100 acres per year.

TABLE 10.—Average Size of Job Performed by Custom Operators by Area for Ohio, 1980.

Operation	Unit	Region NW	SW	NE	SE	State Av	Range
Plow	acre	139	158	76	68	90	1- 950
Plant	acre	170	182	80	139	152	6- 800
Drill	acre	125	73	49	131	92	10- 1,000
Spraying	acre	846	1,335	813	208	814	10- 11,000
Fertilizer application	acre	1,988	1,136	960	370	1,111	9- 30,000
Combine	acre	172	191	144	110	164	4- 2,650
Silo filling	acre	114	298	47	287	233	9- 5,000
Haul grain	bu (000)	29	34	226	122	266	1-350

Distribution by Size of Job

The average custom operator combined 164 acres. Most of the operators, 61%, combined between 0 and 300 acres. Some 9% of the operators combined between 900 and 2,650 acres. It is significant to note that the operators (9%) combining between 900 and 2,650 acres of grain handled more acres of grain than the group combining (64%) between 4 and 300 acres (Figure 2).

A similar pattern was found for many of the other custom operations. Between 10 and 15% of the very large operators handled one-fourth to one-third of all of the acreage or work performed. Typically, 50% or more were small operators handling about the same percentage as this large operator category.

CONCLUSIONS

Custom service provided landlords by their tenant operators is an important part of a lease agreement. Custom rate landlord discounts compared with other farmers for combining averaged 16%. A large part of the total service—one job of every four to one of every three—was done for a landlord by the tenant in Ohio during 1979-1980. Northwest Ohio

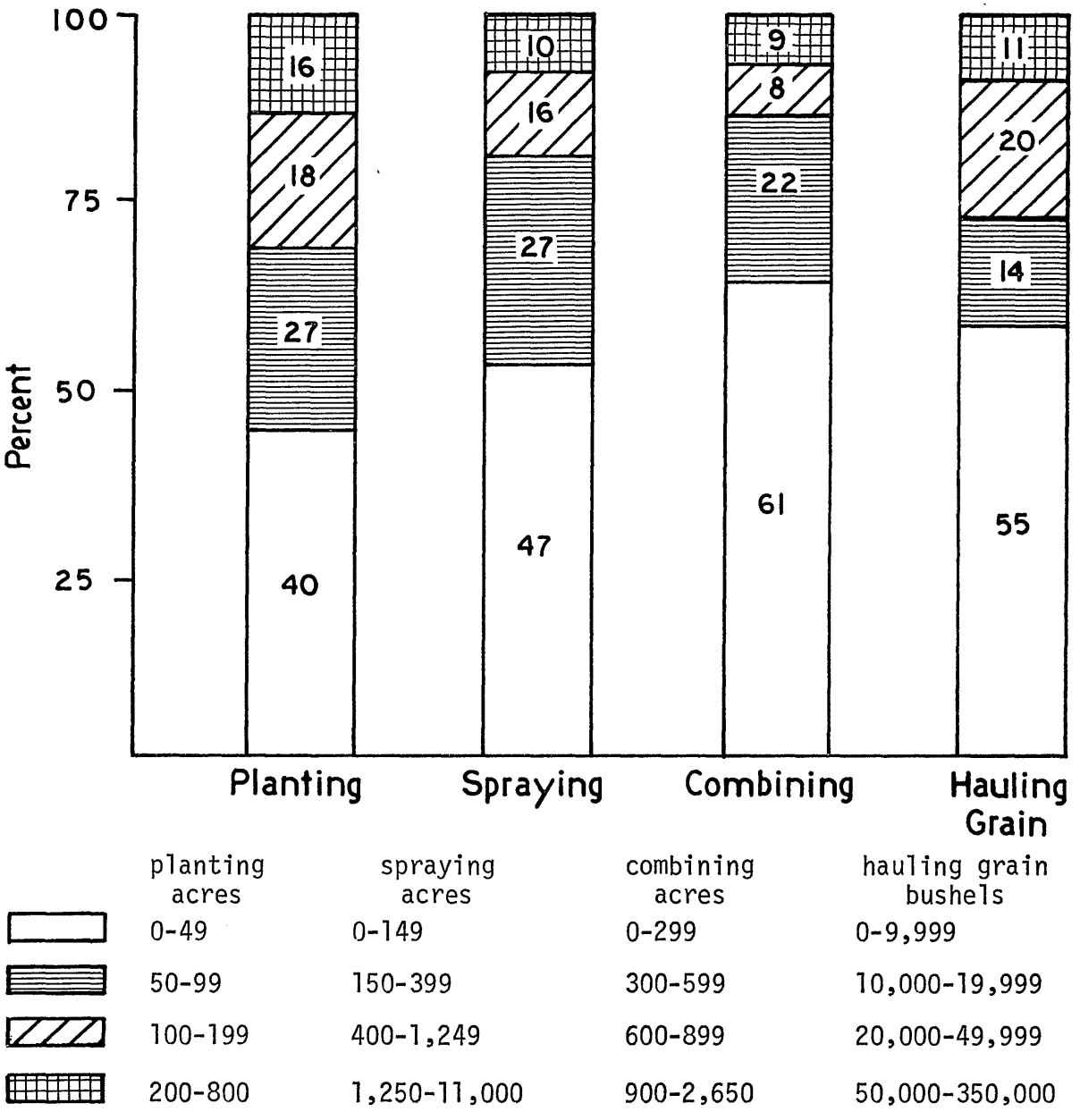

FIG. 2.—Percentage distribution by size of selected custom operations performed, Ohio, 1980.

was found to represent more tenant-landlord custom work and to reflect the largest rate discounts. Southeast Ohio reported the smallest landlord discounts. Northeast Ohio reported the smallest percentage of tenant operators performing work for their landlords.

These findings indicate sufficient rate differential that custom rates need to be reported in accord with the tenure relationship. The returns from and for share leasing of land are significantly influenced by the custom rate charged the landlord by the tenant. Thus it is important that the rate or rate differential for custom work be recognized as an important part of a lease agreement.

Comparing the effective ownership cost with custom rate indicated that a large or small combine used to capacity yields a lower cost than custom rates charged. This also indicates that a farmer custom operator can profitably perform custom services at the rates charged if an adequate volume is achieved. Large combines were found to have a cost advantage compared to small combines. Considering the recent past, these general relationships were found to exist. However, the relative advantage of the large equipment compared to small equipment is tending to increase. Changes in investment costs, interest, fuel and labor are important vectors contributing to the relative advantage of the large machine compared with the small. Tax rates were also shown to be very important in determining ownership costs.

The average custom operator was found to perform a modest amount of work for hire. However, the range in work performed is large. A small number of operators were found to be handling very large acreages and volumes of custom work.

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APPENDIX

APPENDIX TABLE I.—PCA Interest Rate and Selected Cost Indexes, 1972-1980.

Year	PCA Interest Rate	Index*		
		Tractors and Self Propelled Equipment	Wages	Fuel
1972	7.02	128	142	108
1973	8.09	137	155	116
1974	9.43	161	178	159
1975	8.91	195	192	177
1976	8.24	217	210	187
1977	7.88	238	226	202
1978	8.83	259	242	212
1979	11.18	289	265	322
1980	12.50	337	288	388

*1967=100.
Sources: (1 and 4).

APPENDIX TABLE II.—Acres Harvested and Diesel Fuel Consumption for a Small and a Large Combine, Ohio, 1972-80.

Item	Rate	Annual Hours of Use			
		250	300	350	400
		Small Combine			
Acres	2.96 a/hr	740	888	1,036	1,184
Gallons	6.0 gal/hr	1,500	1,800	2,100	2,400
		Large Combine			
Acres	5.10 a/hr	1,250	1,500	1,750	2,000
Gallons	7.5 gal/hr	1,875	2,250	2,625	3,000

APPENDIX TABLE III.—Acres Harvested per Hour for Small and Large Combines, Ohio, 1980.

Crop	Acres (000)	Percent of Total	Small		Large	
			Acres per Hour	Average	Acres per Hour	Average
Small Grain	1,532	17.3	4.1	0.71	6.3	1.08
Soybeans	3,750	42.2	3.6	1.52	5.0	2.11
Corn	3,610	40.6	1.8	0.73	4.7	1.91
Total	8,885	100.0		2.96		5.10

Small=13' grain table, 2 and 3 row corn head.
Large=18'-20' grain table, 8 row corn head.
Source: Ohio Agricultural Statistics. Ohio Crop Reporting Serv., ESCS, USDA, Columbus, Ohio, 1975.

APPENDIX TABLE IV.—Annual Costs for a Small Combine by Utilization, Ohio, 1977-1980.

Period	Hours / Acres	Annual Use 250 / 740	300 / 888	350 / 1,036	400 / 1,184
1972-74					
Fuel @ 0.35/gal		$ 525	$ 630	$ 735	$ 840
Labor @ $3.84/hr		960	1,152	1,344	1,536
Repair*		1,511	1,813	2,115	2,417
Fixed Cost		4,834	4,834	4,834	4,834
Total		$ 7,830	$ 8,429	$ 9,028	$ 9,627
1975-77					
Fuel @ 0.52/gal		$ 780	$ 936	$ 1,092	$ 1,248
Labor @ $5.08/hr		1,270	1,524	1,778	2,032
Repair*		2,396	2,876	3,355	3,834
Fixed Cost		6,390	6,390	6,390	6,390
Total		$10,836	$11,726	$12,615	$13,504
1978-80†					
Fuel @ $0.85/gal		$ 1,275	$ 1,530	$ 1,785	$ 2,040
Labor @ $6.44/hr		1,610	1,932	2,254	2,576
Repair*		3,162	3,795	4,428	5,060
Fixed Cost		8,433	8,433	8,433	8,433
Total		$14,480	$15,690	$16,900	$18,109

*Repair=25 % of new cost—1,000 hours x annual hours of use.
†1980 fuel cost was $1.07/gal and labor $7.00/hr.
Sources: (1 and 5).

APPENDIX TABLE V.—Annual Cost for a Large Combine by Utilization, Ohio, 1972-1980.

Period	Hours / Acres	Annual Use 250 / 1,250	300 / 1,500	350 / 1,750	400 / 2,000
1972-74					
Fuel @ 0.35/gal		$ 656	$ 788	$ 919	$ 1,050
Labor @ $3.84/hr		960	1,152	1,344	1,536
Repair*		2,656	3,188	3,719	4,250
Fixed Cost		8,500	8,500	8,500	8,500
Total		$12,772	$13,628	$14,482	$15,336
1975-77					
Fuel @ 0.52/gal		$ 975	$ 1,170	$ 1,365	$ 1,560
Labor @ $3.84/hr		1,270	1,524	1,778	2,032
Repair*		4,214	5,036	5,899	6,742
Fixed Cost		11,237	11,237	11,237	11,237
Total		$17,696	$18,967	$20,279	$21,571
1978-80†					
Fuel @ $0.85/gal		$ 1,594	$ 1,912	$ 2,231	$ 2,550
Labor @ $6.44/hr		1,610	1,932	2,254	2,576
Repair*		5,613	6,737	7,859	8,982
Fixed Cost		14,970	14,970	14,970	14,970
Total		$23,787	$25,551	$27,314	$29,078

*Repair=25 % of new cost—1,000 hours x annual hours of use.
†1980 fuel cost was $1.07/gal and labor $7.00/hr.
Sources: (1 and 5).

APPENDIX TABLE VI.—Combining Custom Rates per Acre, Ohio, Selected Years.

	Percent of Total	1972-74		1975-77		1978-80	
		Rate	Component	Rate	Component	Rate	Component
Small Grains	17.2	7.25	1.25	11.00	1.89	13.75	2.37
Soybeans	42.2	8.00	3.38	12.00	5.06	16.50	6.96
Corn	40.6	9.25	3.75	12.50	5.07	17.00	6.90
Total	100.0		8.38		12.02		16.23

Source: (6).

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Center Headquarters, Wooster, Wayne County: 1953 acres

Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres

Jackson Branch, Jackson, Jackson County: 502 acres

Mahoning County Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres

North Appalachian Experimental Watershed, Coshocton, Coshocton County: 1047 acres (Cooperative with Agricultural Research Service, U. S. Dept. of Agriculture)

Northwestern Branch, Hoytville, Wood County: 247 acres

Pomerene Forest Laboratory, Coshocton County: 227 acres

Southern Branch, Ripley, Brown County: 275 acres

Vegetable Crops Branch, Fremont, Sandusky County: 105 acres

Western Branch, South Charleston, Clark County: 428 acres